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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/810,858 | 03/26/2004 | Jin-Shan Wang | 82817AKNM | 9107 |

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EXAMINER

SHOSHO, CALLIE E

ART UNIT

PAPER NUMBER

1714

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/810,858

Applicant(s)

WANG ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>3/26/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. If applicant desires to claim the benefit of a prior-filed application under 35 U.S.C. 120, a specific reference to the prior-filed application in compliance with 37 CFR 1.78(a) must be included in the first sentence(s) of the specification following the title or in an application data sheet. For benefit claims under 35 U.S.C. 120, 121 or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications.

If the instant application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition

Art Unit: 1714

must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites wherein “R² is as defined above”. The scope of the claim is confusing because it is not clear by this phrase where R² is defined. It is suggested that the specific R² groups be inserted into the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lent et al. (U.S. 5,929,134) in view of Wang et al. (U.S. 6,252,025).

Lent et al. disclose ink jet ink comprising water, humectant, and 2-5% dye covalently bonded to resin (col.3, lines 24-26 and col.7, lines 4-6, 41-43, and 59-61).

The difference between Lent et al. and the present claimed invention is the requirement in the claims of hyperbranched polymeric dye.

Wang et al. disclose hyperbranched polymer having dye chromophore pendant on the polymer chain wherein the hyperbranched polymer is obtained by chain polymerization process using branching monomers which comprise chain polymerizable group and separate reactive site which is activated and initiates the polymerization. The monomers are of the AB type and comprise chain polymerizable group such as vinyl group and reactive group such as chlorine. It is disclosed that such hyperbranched vinyl polymer with dye is suitable for use in ink jet inks. The motivation for using such hyperbranched vinyl polymer with dye is their solubility, absorption, migration, and viscosity are tunable and they do not sublime, are non-abrasive, and generally have low toxicity (col.1, lines 10-17 and 24, col.2, lines 49-62, col.4, lines 33-35, col.5, lines 16-24 and 32-35, col.9, line 60, and col.10, lines 30-33).

In light of the motivation for using hyperbranched polymer with dye disclosed by Wang et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such hyperbranched polymer with dye in the ink jet ink of Lent et al., and thereby arrive at the claimed invention.

7. Claims 2-3, 6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lent et al. (U.S. 5,929,134) in view of Dvornic et al. (U.S. 2003/0069370).

Lent et al. disclose ink jet ink comprising water, humectant, and 2-5% dye covalently bonded to resin (col.3, lines 24-26 and col.7, lines 4-6, 41-43, and 59-61).

The difference between Lent et al. and the present claimed invention is the requirement in the claims of hyperbranched polymeric dye.

Dvornic et al. disclose hyperbranched polyamide made by reacting multifunctional carboxylic acid such as succinic acid, adipic acid, terephthalic acid, etc. with multifunctional amine such as tris(2-aminoethyl)amine, triethanolamine, etc. Dvornic et al. also disclose hyperbranched polyester made by reacting multifunctional alcohol with multifunctional carboxylic acid wherein at least one monomer has functionality of at least 3 and the other monomer has functionality of at least 2. It is further disclosed that the polymers are terminated with amine, carboxyl, or hydroxyl groups. The motivation for using such hyperbranched polymers is that they possess lower viscosity and better shear thinning properties than linear polymers and are also less expensive to produce (paragraphs 2-3, 6, 8-9, 14, 18-19, and 30-32).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use hyperbranched polyester or hyperbranched polyamide as the resin in the ink jet ink of

Lent et al. in order to produce ink with suitable viscosity and shear thinning properties, and thereby arrive at the claimed invention.

8. Claims 2-3, 5, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sacripante et al. (U.S. 6,025,412) in view of Figuly (U.S. 5,136,014).

Sacripante et al. disclose ink jet ink comprising water, humectant such as glycerin or diethylene glycol, and 2-20% polyester having dye attached to the base chain as side chain component (col.1, lines 5-10, col.3, lines 42-50, col.3, line 64-col.4, line 5, col.5, lines 59-67, col.6, lines 58 and 60-61, and col.9, lines 24-28 and 48).

The difference between Sacripante et al. and the present claimed invention is the requirement in the claims of hyperbranched polymeric dye.

Sacripante et al. disclose polyester having dye attached, however, there is no disclosure that the polyester is hyperbranched polyester.

Figuly disclose hyperbranched polyester prepared by polycondensation of monomer of the formula XR^2Y where X and Y are selected from $-CO_2R'$ and OR'' where R' is H or C_1-C_{12} alkyl and R'' is hydrogen. The motivation for using such hyperbranched polyester is to reduce viscosity (col.2, lines 21-51, col.3, lines 56-58, col.6, lines 3-4 and 20-26, and col.14, lines 39-43) which is especially relevant to ink jet inks where it is important that the viscosity of the ink is low enough so that the ink does not clog the printer nozzles.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use hyperbranched polyester as the polyester in the ink jet ink of Sacripante et al. in order

to produce ink which has suitable viscosity for printing, and thereby arrive at the claimed invention.

9. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sacripante et al. in view of Figuly as applied to claims 2-3, 5, and 8 above, and further in view of *Polymer Science Dictionary*.

The difference between Sacripante et al. in view of Figuly and the present claimed invention is the requirement in the claims regarding how the hyperbranched polyester is obtained.

Figuly discloses producing polyester by self-condensation of monomer XR^2Y where X and Y are selected from $-\text{CO}_2\text{R}'$ and OR'' where R' is H or $\text{C}_1\text{-C}_{12}$ alkyl and R'' is aliphatic or aromatic group, however, there is no disclosure of producing polyester by reacting monomers of the type disclosed in present claims 6 and 9.

However, it is well known as found in *Polymer Science Dictionary* (page 407) that polyester is also produced from condensation reaction of diacid, which corresponds to presently claimed $\text{R}^2\text{-M}^5_q$ when R^2 is alkyl or aromatic group and M^5 is $-\text{COOH}$, with triol, which corresponds to presently claimed $\text{R}^3\text{-M}^6_t$ where M^6 is $-\text{OH}$.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to produce polyester by reacting triol with dicarboxylic acid, and thereby arrive at the claimed invention.

Art Unit: 1714

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wang et al. (U.S. 6,541,600) disclose highly branched polyamide having attached dye, however, given the effective filing date of the reference, Wang et al. is not applicable against the present claims under any subsection of 35 USC 102.


Winnik et al. (U.S. 5,098,475) disclose ink comprising dendrimer having attached dye.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CS
4/28/06


Callie E. Shosho
Primary Examiner
Art Unit 1714